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EMERGENCY ENTOMOLOGICAL SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE.

Reporting cooperation between Federal, State and Station Entomologists and other Agencies.

Number 5. Washington, D.C. September 1,1917.

CONTENTS.

FUNDS FOR EMERGENCY WORK IN ENTOMOLOGY.

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Insects attacking wheat, oats, corn, hay, etc. in the field and storage:
(a) In the field - chinch bug, Hessian fly, jointworms, cutworms, alfalfa weevil, etc.....$45,575.00
(b) Granaries, mills,etc.- grain weevils, Mediterranean flour moth, pea and bean weevils..... 22,000.00
Insects attacking apple, pear, peach, grape, etc.- Codling moth, San Jose scale, plum curculio, grape berry moth and borers 15,000.00
Insects attacking potato, beans, peas, cabbage, etc. cutworms, cabbage worms, potato beetle, plant lice, cucumber beetles, etc..... 30,000.00
Insects attacking orange, lemon, pineapple, etc. Orange mealy bug, orange white fly, scale insects, red spider etc..... 6,000.00

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(a) In the field - cutworm bug, Hessian fly, armyworms, cutworms, alfalfa weevil, etc. $45,575.00

(b) Granaries, mills, etc.- grain weevils, Mediterranean flour moth, pea and bean weevils. 25,000.00

Insects attacking apple, pear, peach, grape, etc.-

Codling moth, San Jose scale, plum curculio, grape berry moth and borers 15,000.00

Insects attacking potato, beans, peas, cabbage, etc.

cutworms, cabbage worms, potato beetle, plant lice, cucumber beetles, etc. 20,000.00

Insects attacking citrus, lemon, pineapple, etc.

Orange moth, bug, orange mite fly, scale insects, red spider, etc. 6,000.00

Insects attacking cattle, hogs, sheep, etc.
Horn fly, screw worm, etc.....$10,000.00
Insects attacking rice - rice weevils, rice billbug,etc..... 5,600.00
Insects attacking sugar cane- sugar cane borer,
white grubs, etc..... 5,600.00
Office of Extension Work in Entomology..... 6,000.00

Owing to the emergency character of the work and to the fact that it must be regional in scape rather than by state lines, and to the sporadic nature of many insect outbreaks, the specialists of the Bureau of Entomology will at all times be subject to orders from the Department of Agriculture as to work to be undertaken and as to the period of their activities in any state. After preliminary arrangements have been made by the Bureau with the entomological service of the various states, men will be assigned to work in the states in cooperation with the State Extension Service. Formal projects are now being prepared and will shortly be presented, through the States Relations Service of this Department, to the State Directors of Extension.

It is contemplated to inaugurate the present fall an extensive campaign against the Hessian fly and to undertake work on a large scale in the control of insects injurious to stored grains, peas, beans and stored products generally. During the winter, work in dormant-trees spraying for scale insects, fumigation of citrus trees and similar activities will be actively pushed. Beginning with another growing season however, work along the various lines indicated will be inaugurated in a way to cover the country as effectively as possible. Never before in the history of economic entomology in this country have there been funds to carry, on so large a scale directly to the farmer, fruit grower, stock man and others, practical instruction in the treatment of insect pests.

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SUGGESTIONS
FROM STATE AND STATION ENTOMOLOGISTS.

Prof. R.W. Harned gives the following interesting account of special emergency work in Mississippi:

"In order to increase the production of fruit in this state we have started a systematic campaign to get the people to spray their trees. The governor has promised to issue a proclamation designating the week of December 9-15 as "Spray Your Orchard Week". This will be the week when the final drive will be made. On Sunday, December 9, 1917, the ministers of the state will preach sermons on the subject. Outline sermons will be prepared and placed in the hands of all ministers. During that week the teachers of all schools of the state will make it a point to teach about the spraying of trees. The county demonstration agents, home economics agents, and all the extension workers of the Agricultural College will spend this week in giving spraying demonstrations and holding meetings in every county in Mississippi. The agricultural journals that circulate in this state will issue "Spraying Specials" devoted almost entirely to this subject. The daily and weekly papers throughout the state are giving the work their most hearty support, and each week publish articles in regard to the spraying campaign that is to be started this winter. The large fairs held at Memphis, Tenn., Mobile, Ala., New Orleans, La., Jackson, Miss., and Meridian, Miss., and the county fairs held in nearly every county in Mississippi are each devoting one page in their catalogues to "Spray Your Orchard Week". At all of these fairs exhibits of spraying machinery and spray chemicals and mixtures will be made, and at many of them daily spraying demonstrations will be given.

The retail hardware dealers are getting extra supplies so as to be ready to meet the demand for spraying machines and spray mixtures and most of them will make special window exhibits of these supplies. The manufacturers of these supplies have had a meeting here at the college and are cooperating in every possible way by extra advertising in agricultural and county papers, and by sending their literature direct to the farmers in every county of the state. These lists are supplied by the county workers.

The State Superintendent of Education and the State Commissioner of Agriculture, and all of the forces connected with them, and the railroads of the state are also helping greatly, especially through the cooperation of their agricultural agents. Mr. L.G. Herron of our extension force is the man who is managing the "Spray Your Orchard Week" campaign most successfully. The educational and propaganda work is now under full swing, and will continue to gather momentum until the big drive that will be made during "Spray Your Orchard Week" from December 9 to 15, 1917. After that a follow-up campaign is being planned. The chief thing now is to get people started in the use of spraying machinery. Once started, the plan is to keep right in behind the work on every farm in the state so as to see that the trees are sprayed regularly and properly during the spring and summer."

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Mr. V.I. Safro makes the following suggestions:

"The past season with the increased activity in, and necessity for, greater food production has again shown the need for the dissemination of the proper entomological information. During the fall and winter entomologists can render considerable service in preparation for the next year's insect control campaign.

With the increased interest on the part of school authorities in "war gardens", the present fall and winter seem to be very opportune times to offer special short courses in the principles of insect control to school teachers throughout the country. Such courses could be given at the State Institutions or by correspondence.

However, the most constructive good, it seems, could be accomplished by classifying the newspapers of the state into crop districts and determining for each crop in each district the approximate date at which certain insect control information would be most needed and of most interest. By mimeographing these news articles this winter, they can be distributed at the proper times throughout the spring and summer.

By adopting this procedure, the information each paper receives will be timely as well as applicable to the conditions obtaining in the district covered by the publication."

Dr. E.P.Felt's "Digest" of August 23 contained the following:

"Household Insects and Pests of Domestic Animals: There is no sharp division between the two since some species, especially the house fly, are to be found in houses, stables and the fields. Generally speaking, excessive numbers of house flies, horn flies, horse flies and other animal pests mean that the insects are breeding nearby and that a moderate expenditure would result in greatly alleviating the annoyance caused by them and lessen very materially the losses they inflict. It is late in the season to do much effective control work this year though now is the time to get a good idea of the cause of the trouble and to make plans for eliminating the nuisances next year. Hordes of flies and mosquitoes exist by the sufferance of man and in not a few instances because he has unconciously provided almost ideal breeding places for them. There is no question in the writer's mind but that systematic measures for the control of flies would be profitable in the greater production of milk and meat, other conditions being equal, not to mention the increased comfort for both man and beast."

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REPORTS ON INSECT CONDITIONS.

Cereal and Forage Crops.

On August 20, Mr. E.O.G. Kelly wrote from Wellington, Kansas, that the first emergence of Hessian fly was taking place. Similar reports have been received from Mr. H.J.Hart, located at Falls City, Nebraska.

A post card warning the farmers of Illinois to take precautionare measures against the Hessian fly was issued by the Department about August 15 in an edition of 20,000 copies. This card was published at the request of Dr. S.A.Forbes and distributed through him.

The following report comes from Prof. George A.Dean of Kansas, under date of July 24. "While there is no very serious outbreak of chinch bugs, there are several local infestations. Very probably the infestation will become serious enough to warrant the organizing of counties for cooperation in the burning of the winter quarters of the bugs."

A severe outbreak of grasshoppers in South Dakota was reported by Prof. H.C.Severin, under date of July 28. A scarcity of Paris green and white arsenic hampered the efforts of entomologists in the use of poisoned baits. Mr. C.N.Ainslie, attached to this branch, has been on the ground for some time and is at present conducting experiments and demonstrations in poisoning the insects. Some difficulty has been experienced in securing effectiveness, apparently because low-grade molasses was not easily procurable and had not been used.

Prof. George A.Dean reports, under date of July 24, that several local outbreaks of grasshoppers had occurred in western Kansas, but control was secured without difficulty by means of poisoned baits.

A report that severe grasshopper infestation was present in the San Juan and Pine River Valleys of western Montana was received under date of August 15. It was reported that the infestation originated on land owned by the Ute Indians and the Federal Government. For this reason his complaint was referred to the Bureau of Indian Affairs which has reported that the matter is receiving careful attention. Doubtless this is a continuation of the outbreak recently reported by Prof. C.P.Gillette, who has had an entomologist working in this region.

Mr. J.J.Davis, assisted by Mr. W.H.Larrimer, recently has conducted a series of experiments in determining the utility of sawdust for the much more expensive wheat bran in poisoned baits for cutworm extermination. The following summary of the work was prepared by Mr. Davis and should prove of interest to entomological workers generally:

"At Johnson, Indian areas infested with the so-called "overflow worm" (Agrotis ypsilon) were treated with poison baits, using the poison at the rate of one pound to 25 pounds of filler (sawdust or bran), two quarts molasses, 6 citrus fruits, and water as needed. Three formulae were used, Paris green and bran, Paris green and sawdust, and white arsenic and bran. These were scattered broadcast at the rate of 5 pounds per acre.

The ground treated July 9 was replanted to corn about July 14. Counts made July 23 gave the following results:

Paris green and bran - 2 per cent plants cut.
Paris green and sawdust - 5 per cent plants cut.
White arsenic and bran - 3 per cent plants cut.
Check, 50 per cent plants cut.

At Akron, Indiana, similar experiments were conducted with the army worm (Cirphis unipuncta). When scattered broadcast at the rate of 10 pounds per acre the following results were obtained, applications being made late one evening and counts the following morning before the worms had sought shelter.

Paris green and bran 1 to 25, 76.3 per cent worms dead.
Paris green and bran 1 to 50, 65.7 " " " "
Paris green and sawdust 1 to 25, 55.5 per cent worms dead.
" " " " 1 to 50, 57.1 " " " "

Examinations made two days after application showed approximately 75 per cent value in sawdust areas and practically all were dead in the bran areas. Approximately the same results were obtained by their use in furrows ploughed around the field.

Although the poisoned sawdust gave less favorable results in our experiments it is believed that by certain changes in the formula it will be possible and practicable to substitute sawdust in poison baits for cutworms. Sawdust scatters in very fine particles and dries out quickly. This and the value of different textures and kinds of sawdust are points now being tested."

Many reports on injuries by the lesser corn stalk-borer have been received from the Gulf States during the months of July and August, and particularly from Mississippi which has apparently suffered most. Prof. R.W.Harned under date of July 30, states that he has been receiving a large number of complaints. "Some of the farmers and demonstration agents claim that 90 per cent of the young corn has been ruined by these insects."

Several reports of injuries to young cowpeas and soy beans by the insect have been received. The larvae penetrate the stalks of the legumes slightly below the surface of the ground and work in the center of the stem in a manner similar to the injury on corn. A Departmental bulletin treating on this insect, under the joint authorship of Mr. George G.Ainslie and Philip Luginbill, is expected from the press at any moment.

W. R.Walton.

Southern Field Crop Insect Investigations.

On the whole as far as cotton insects are concerned the situation at the present time is very favorable. Throughout the greater part of its range the boll weevil is found in small numbers. The most severe injury is being done in the extreme southeastern states. In some fields of sea island cotton in northern Florida which have received excellent

attention the crop has been practically ruined. In one instance on rich land a crop of only about thirty pounds per acre will be produced. In Madison Parish, Louisiana, during the middle of the month the infestation averaged only about one per cent of the fruit. One hundred and fifty miles north of Madison Parish, in Arkansas and Mississippi, the infestation was considerably heavier.

The threatened outbreak of Alabama argillacea has not materialized. One generation was produced in a number of fields in the vicinity of Savannah. The insects seem to have been controlled by parasites.

Up to the present time comparatively few reports of injury by the boll worm have been received.

In the cotton cultures in Arizona and California there has been some little damage by the bollworm, but much more by Lygus pratensis.

Generally the rice crop has been harvested and the actual injury by insects has been found to be less than was expected, although the reduction in the crop in Matagorda County, Texas, was considerable.

Sugar cane and tobacco insects show no peculiarities at the present time, although the tobacco horn-worms are still somewhat less numerous than usual.

A thrips has done very considerable injury to peanuts throughout the South. The injury is easily overlooked. The shriveling of the leaves has generally been attributed to unfavorable weather. The insect seems to be of decided importance in connection with the culture of peanuts.

W. D. Hunter.

Truck Crop Insect Investigations.

Complaints of injury to potato by aphids have continued, but about the middle of August the complaints began to decline, showing that the insect was evidently being destroyed by atmospheric conditions together with numerous natural enemies which usually keep them in check. It is a question as to whether they will renew attack late in the fall or early winterin the South. This applies to the pea aphis, bean aphis, strawberry aphis, and other related species.

The sweet potato borer (Cylas formicarius) is still the subject of much complaint and new infected localities have been added. The melon aphis continues abundant in and around the District of Columbia and northward and westward, and the common ladybirds usually found on truck crops, Hippodamia convergens and Megilla maculata, have been activein destroying them. Melon aphis work found as far north as Washington State. The cabbage aphis has been troublesome on cabbage in Iowa, and the turnip aphis (Aphis pseudobrassicae) has also been determined on cabbage in the same locality.

Some new parasites and other natural enemies are developing on the cabbage looper, which species does not appear to be so injurious as in previous seasons at this time. New parasites were also developing on a number of species of injurious pests.

Several reports have been made [illegible] various portions of the country of injury by the raspberry fruit-worm ([illegible]us unicolor), one being received from Portland, Maine. The bean leaf-beetle continues as a pest in

many regions where little is done to effect its control. Cutworms have been reported injurious from New England westward through Illinois, Kentucky, Michigan, Minnesota, Utah and Oregon, but the species concerned are unknown. Considerable injury is being effected by the melon and cucumber caterpillars (Diaphania spp.) in Florida, Georgia, South Carolina, and even as far north as Indiana. The squash stem borer continues as a topic of much complaint. The potato or bean leafhopper (Empoasca mali) is found almost universally on potato, tomato and beans throughout a large part of the country, especially in the North. The bean ladybird (Epilachna corrupta) has been injurious to beans in Colorado and New Mexico. The potato flea-beetle (Epitrix cucumeris) has continued as a pest during the month, working chiefly on potato and tomato from the District of Columbia and Maryland through large sections of New Jersey and Pennsylvania, and report has also been received of injuries in Iowa and Massachusetts. Grasshoppers have been unusually troublesome to vegetable crops, according to reports received from the District of Columbia, Michigan, Nebraska, New York and Vermont. The principal crops being affected are potato, beans, cucumber, beets and other vegetables. The corn ear worm or tomato fruit worm is probably much more injurious than reported, but it is certainly not as injurious as last year. The Colorado potato beetle, which was not particularly injurious in its hibernating generation, has proved to be quite abundant in numerous localities, especially in the North. It has been reported injurious in somewhat unusual districts, especially in new localities in Idaho. Blister beetles are normally troublesome, and appear to be increasing. The potato aphids, principally Macrosiphum solanifolii and Myzus persicae have continued as the subject of greatest complaint. About 120 complaints have been received during the month, chiefly on potato, tomato and eggplant and other vegetables. They are not so injurious at the present writing. There is reason for believing that they will again become abundant in the autumn and early winter southward. The harlequin cabbage bug has been conspicuous by its absence in the North. It appears to have met with a considerable setback during the past winter and cold spring. The root maggots continue to be very troublesome, but are not so abundant as in the spring. New localities have been observed for the horse radish flea-beetle which bids fair to be a pest of some importance. Cabbage worms have become more abundant than during July. One of the green plant bugs (Nezara viridula), which has been injurious in Louisiana for some time, continues troublesome. The armed squash bug (Anasa armigera) is working farther northward than usual, occurring in Wisconsin and Indiana. Recent reports show that other species than the sweet potato borer are unusually troublesome on this vegetable in different localities. The lesser corn stalkborer (Elasmopalpus lignosellus) has been reported injurious to young beans in Louisiana. More reports of injury have been received in regard to the three-lined potato beetle (Lema trilineata) than ever before. It is more abundant now than during July. The squash ladybird (Epilachna borealis) has also been more troublesome than usual, especially in Maryland and Virginia. Strawberry leaf-rollers continue injurious and some experiments have been made on remedies. The strawberry root-weevil (Otiorhynchus ovatus) continues as troublesome in portions of Oregon.

F. H. Chittenden.

Deciduous Fruit Insect Investigations.

No important insect outbreaks in orchards, vineyards, etc. have come to the attention of the Bureau during August, and conditions on the whole continue to be favorable as regards serious insect damage to fruits. Numerous species of caterpillars, usually more or less prevalent during late summer and early fall, have attracted attention, as the eight-spotted forester (Alypia octomaculata), the walnut caterpillar, (Datana integerrima), the hickory moth (Halisidota caryae), the fall webworm (Hyphantria cunea) in the east, and in portions of the Pacific northwest the western fall webworm (Hyphantria textor) . The yellow-necked apple-tree caterpillar (Datana ministra) and the tussock moth Hemerocampa leucostigma) have also come in for some complaint, as well as the red-humped apple-tree caterpillar (Schizura concinna). Usual injuries from a cherry maggot (probably Rhagoletis cingulata) have been reported by Mr. E.J.Newcomer from portions of Oregon, and similar injuries are reported from localities in New York State. The peach lecanium (Lecanium nigrofasciatum) has been complained of in peach orchards in western Maryland.

It should be recorded that Popillia japonica, an apparently recently introduced Japanese beetle, has become well established at Riverton, N.J. Observations already made indicate that it may become a serious pest, as it is a very general feeder, attacking among other plants the grape. Careful investigation of the species is now under way by the Bureau of Entomology in cooperation with Dr. T.J.Headlee, of the New Jersey Agricultural Experiment Station.

A.L. Quaintance.

Tropical and Subtropical Fruit Insect Investigations.

Mr. Woglum reports that the eggs of the black scale are still to be found in some districts, and wherever this condition obtains fumigation should be delayed until the middle or last of September. Fumigation schedule No. 1 should be followed.

Fumigation for the citricola scale is not fully effective later than the present month. The purple, red, and yellow scales can be treated at any time.

The citrophilus mealy bug is decidedly less numerous than during July. The common mealy bug is appearing in increasing numbers on the new growth in several orchards in Los Angeles and San Diego Counties. Large colonies of natural enemies should be liberated at this time to prevent this insect becoming severe.

Red spider and the silver mite are appearing in very injurious numbers in San Diego County. These may be controlled by lime-sulphur spray, strength $2\frac{1}{2}$ per cent, 32° Baumé.

Mr. Ernest R.Barber reports that since the report issued in the May Emergency Circular the fluted scale infestation in and around New Orleans has been effectively checked. Until mid-June the Vedalia reproduced very prolifically and spread with remarkable rapidity until it had

reduced the original infestation by about 90 to 95 per cent. Since that time the heat and moisture have apparently retarded the multiplication both of the Vedalia and the fluted scale and in a few instances the fluted scale has increased to some extent. It is expected that when the weather moderates the activity of the ladybugs will be resumed.

C. L.Marlatt.

Stored Product Insect Investigations.

During the past month there has been a large increase in the demand for information regarding the treatment of beans and peas to prevent weevil attack. These requests have come from all sections of the country but more particularly from the East, South and the Pacific Coast. Accompanying requests for information regarding treatment, are statements indicating that there has been a large increase in the acreage of beans and peas and that the stored crop to be protected will be unusually large.

E.A. Back.

Forest Insect Investigations.

In the temporary absence of Dr. A.D. Hopkins the following statement has been prepared by Mr. E.T. Snyder.

In view of the fact that in the present war much stress is being laid on the conservation of the resources of the country, suggestions for the conservation of forest products from losses by wood-boring insects are in order. The proper timely application of results of the special and intensive investigations conducted by the Branch of Forest Entomology would result in the saving of material, time and money.

Investigations in Forest Entomology, while they have no direct relation to increasing and conserving the food supply, have direct importance in the conservation of both crude and finished forest products for supplying the needs of the country in the present emergency and in the manufacture of machinery and implements used in agriculture and thus preventing serious economic loss. These investigations have determined methods of protecting timber from the time the tree is felled in the woods until and after manufacture into the crude or finished product.

Insect damage to lumber results either in the total or partial destruction or deterioration of timber - easily detected, prevented and remedied - or the more insidious undetected weakening of timber which may later suddenly break and possibly endanger human life.

Inspectors of timber to be used for such important uses as shipbuilding or airplane construction should be able to determine whether a defect in a board is due to insect damage in the living tree and the lumber is "sound wormy" (i.e. due to "timber" and "carpenter" worms and ambrosia beetles) or whether due to powder post beetles which continue to work in the manufactured product.

The rejection of the former defective lumber, since the insects no longer work in it, is avoidable loss, whereas the acceptance of the

latter may result in tragedy.

The publications on white ants and powder post beetles give definite detailed information on how to construct white ant proof buildings and how to prevent and remedy damage by powder post beetles to seasoned hardwood.

Certain insects attack newly felled trees, saw logs, poles, posts, mine props, and like material cut in the fall and winter and left on the ground or in close piles with the bark on during the few weeks or months in the spring and summer, while those cut during the spring and summer offer conditions most favorable to attack by insects the work of which is detrimental to the wood.

Damage to pulp wood, stave and shingle bolts, tanbark and other crude products at present very common and neglected, is also a preventable loss.

In the construction of cantonments and buildings for storing quartermaster department supplies special attention should be given in the erection to prevent attack by wood-boring insects, especially white ants or termites. It has been found that these insects cause considerable damage to army and navy structures and stores and this can be avoided through proper construction and treatment of the wood, proper cutting and handling of such timber and treatment before placement, especially where used in the foundation of buildings. The replacement of damaged timber often involves the loss of more time and money than their original placement.

Telegraph and telephone poles, mine props, and railroad ties can be properly treated to prevent damage by wood-boring insects.

Large quantities of mesquite cordwood are used at the army posts in southwestern United States, especially along the Mexican border. This cordwood is stored near the camps and becomes completely riddled by wood-boring insects, greatly reducing the wood in value, weight, and consequent fuel value. Proper handling and storage can prevent this damage.

Seasoned shipbuilding and airplane lumber stored in large quantities and finished stores, such as wheelbarrow, tent poles, cars, airplane parts, shovel and pick handles, and many other hardwood articles used in the military service are subject to serious damage by powder post beetles. These losses can be largely prevented. Powder posted pieces must be closely guarded against to prevent possible serious accident while in use.

Markets for native American species of wood and wood fiber products in South and Central America can only be obtained after proper treatment against white ants are devised. More investigations and tests are necessary although considerable progress and several effective treatments have already been accomplished.

On the Pacific Coast 25 per cent of all wire trouble to the lines of telephone and telegraph companies is caused by a forest insect which bores through the lead sheathing of aerial cables. These insects bore through to the insulation and thus afford access to moisture which causes short circuits. This may suddenly shut off several communities from light and communication at once. This is due to the fact that the trouble comes all at the same time after the rains and it makes the trouble very difficult and expensive to remedy. Further study and investigation are necessary to develop methods of preventing this type of insect damage, but these investigations need to be conducted on a scale that the available funds do not warrant.

These are probably the most important insect problems relating to the conservation of forest products in the present emergency. The control of the insects causing these types of damage will be instrumental in the saving of timber used directly or indirectly in military operations, and this branch of the Bureau is prepared to do all that available funds will permit to advise and instruct all agencies in charge of forest products in the necessary measures to safeguard against these losses.

Mr. T.E. Holloway submits the following statement from New Orleans:

In the emergency circular issued August 1st, the writer had a note on the abundance in New Orleans of the white moths of Hyphantria textor, the spotless fall webworm moth, during the week of July 8th, especially on July 13th. The local entomological workers were not surprised to receive a report of damage by the larvae of this species on August 7th. At one residence the webworms were found in extraordinary numbers. They had defoliated a large mulberry tree in the front yard and were dropping to the ground and apparently searching for other food plants. The whole tree, limbs, twigs, and trunk, was covered with the webs, which even extended for several yards at the base. A willow tree about forty feet away was being attacked, as were also palms along the street in front, rose bushes and a banana plant. The larvae both large and half grown were roaming over the walks, on the ground, and crawling up the sides of the two-story house. Most of the windows of the place had to be kept closed. The webworms covered the rocking chairs on the front porch and formed wriggling clusters on the knobs at the top of the chairs, much like seed ticks on grass. From the trees and sides of the house they were continually dropping in a fashion very annoying to the spectator. An automobile left in the street in front was soon covered, and had to be driven a short distance away where the webworms could be picked off.

A statement on the subject appeared in the New Orleans Times-Picayune on August 8. The same day the city arranged for the premises described to be sprayed at the expense of the city. The city government engaged at least one power sprayer outfit and is now treating the worst infestations. It was suggested that the trees be sprayed with arsenate of lead, and this is being done successfully.

Considerable space was given to the subject of the infestation by the New Orleans papers for the next several days. It is evident that the recent local campaign for the control of the control of the cottony cushion scale has resulted in an awakened interest and appreciation of entomology, both by the city officials and the general public.

Insecticides.

The situation in regard to arsenical insecticides has not materially changed, though present quatations on white arsenic are somewhat lower than recently. The importance of an adequate quantity of spray materials, as white arsenic, sulphur and bluestone, has recently been called to the attention of the Secretary of Agriculture. He has appointed a committee, composed of representatives of the various interested Bureaus, with Dr. C.L. Alsberg, Chief of the Bureau of Chemistry as Chairman. At a recent meeting of the committee recommendations were made which it is believed will result in improving the situation considerably.

A. L. Quaintance.

MEDICAL AND VETERINARY ENTOMOLOGY.

In several respects the world war is operating against the repression of malaria. Successful sterilization of the blood of an infected individual by the use of quinine does more than cure the patient of the disease. It prevents the possible development of gametes in the blood and the consequent production of a carrier of the disease from whom the Anopheles can obtain the parasites and become infective. Quinine is the one known specific for malaria. Before the war this drug sold at retail for about twenty-five cents an ounce. It is now selling for one dollar and thirty-five cents an ounce and has been as high as two dollars and fifty cents an ounce. The poorer classes suffer most from the disease and the present cost of adequate treatment works special hardship upon them. If this product has been the object of manipulation in the market, the profit gained by the manipulators has been dearly paid for by the suffering and death of those from whom treatment has been withheld by reason of the high price of the drug.

The use of wire cloth screening and mosquito bars for protection from mosquitoes has been greatly lessened since the war began. All wire cloth has advanced in price and some of the former standard grades are not at present on the market. Many dwellings constructed within the past few years are not effectively screened and even the usual replacing and repairing of worn out or damaged screens have not been made on older dwellings because of both the cost and trouble in obtaining the wire cloth. The standard material for mosquito bars for use over beds was formerly an imported article from one of the countries laid waste by the German Army. The stock of this bobinet is about exhausted in this country and the high price of the small quantities available places it without the reach of those who need protection from mosquitoes. The American mosquito bar material has always been an inferior product, lacking in both durability and efficiency. The more recent product placed on the market as a substitute for the imported bobinet is not durable and the weave is such that the meshes stretch in use, giving openings large enough for the entrance of mosquitoes to the inside of the bar. An inefficient mosquito bar, like a poorly screened house, becomes a trap for mosquitoes and insures their obtaining not one but several blood meals. These factors all operate against the treatment and prevention of malaria and contribute to the losses from the disease.

D. L. Van Dine.

GENERAL REPORTS ON CONDITIONS IN STATES.

ALABAMA.

The cotton worm, Alabama argillacea, has not yet been reported to this office in Alabama. Some of the reports of its occurrence were evidently based upon the roasting ear worm, Heliothis obsoleta.

It is possible that the sweet potato borer, Cylas formicarius, has been introduced into Baldwin County during the present season. I am about to investigate this report but have no doubt that the insect occurs even though it may not be found at this time.

In order to save as much as possible of the corn crop that is now being made, we are undertaking an extensive educational campaign for the control of the insects attacking stored corn. A press bulletin on the subject is being distributed widely through the State at this time. I believe that these suggestions will also be applied through most of the other southern states. I have written the entomologists of these states accordingly.

W. E. Hinds,
August 23,1917.

ARIZONA.

The tarnished plant bug, the injury of which to cotton was first noted in my Seventh Annual Report, has been unusually active this season and caused considerable loss to Egyptian cotton growers.

Differential grasshoppers have continued active in parts of the Salt River Valley but have usually been successfully checked with poisoned baits. Cantaloupe, which can be obtained by any farmer here without expense, has been found to be a successful substitute for lemons or oranges in the poisoned bait formula, using one pound of cantaloupe to 25 pounds of bran. Molasses (black strap) appears not to add to the effectiveness of the bait in any degree. A half and half mixture of pine sawdust and wheat bran frequently gives as good results as straight bran and our observations show that a third sawdust at least can be safely recommended. Probably a non-resinous sawdust would be better. These modifications of the ordinary poisoned bait offset the high cost of wheat bran.

The Colorado potato beetle has been unusually active in the northern part of the state where there has been a large increase in the potato acreage. An unusual difficulty in controlling the beetle has arisen as a result of almost daily rains.

Apples and pears are reported from various sections of the state as being unusually free from codling worm injury. This is in part due to increased interest in spraying and in part to a natural decrease in the abundance of the worms.

A. W. Morrill,
August 24,1917.

CONNECTICUT.

Injury by elm leaf beetle has been observed at several points indicating that it is more prevalent along the shore, at least, than for several years.

The yellow-necked caterpillar, Datana ministra, the walnut caterpillar, Datana integerrima, and the red-humped caterpillar, Schizura concinna, are all very abundant and are stripping small trees throughout the state.

The fall webworm, Hyphantria cunea, and the tussock moth caterpillars, especially Halisidota caryae and H. tesselaris, are unusually prevalent and attack fruit, shade and woodland trees throughout the state. In the towns and cities the white-marked tussock moth, Hemerocampa leucostigma is abundant and the caterpillars have been crawling everywhere. Now the old cocoons and egg-masses are much in evidence on trees, fences, and buildings.

The potato aphid has caused considerable damage but has now disappeared from potato fields, many old shells of parasitized aphids remaining.

Grasshoppers and crickets are very abundant and the young bid fair to destroy or greatly reduce the second crop of hay in many fields.

W.E. Britton,
August 25,1917.

FLORIDA.

We have nothing at this time to report except that the cotton boll worm (Heliothis obsoleta) is becoming serious in several parts of the state according to reports and specimens received. A serious infestation, with specimens, has been reported from the vicinity of Groveland, Florida, and another from Monticello, Fla. Specimens have also been received here at Gainesville. The same insect continues to seriously infest corn.

E.W. Berger,
August 25, 1917.

ILLINOIS.

Mr. A.M.Augustine, Secretary of the Illinois State Horticultural Society issued the following statement on August 18.

"Mr.P.A. Glenn who has charge of the codling moth investigations work of the Department of Entomology, has kindly kept the Secretary's office informed of the hatching dates for the benefit of the members of the Horticultural Society.

It was taken for granted up to a few years ago that the codling moth had but two broods a season. Three years ago the havoc wrought by the third brood in the apple crop taught us that the third brood demanded just as much attention as the other broods. Remember in making your calculations

as to latitude, this year there is but little difference in hatching dates for the various latitudes. The dates being much more uniform than usual over the entire state.

Larvae of the third generation of codling moth will begin to hatch as follows: In the latitude of Ozark about August 18, Olney, August 22, and Springfield, August 28. Should the weather be unusually warm until hatching time they will begin to hatch a few days earlier. Continuous warm weather during the month of August will favor a large third brood. Cool weather with especially chilly nights will shorten the time during which the larvae will hatch as well as decrease the size of the brood."

IOWA.

I wish to record the abundance of grasshoppers in various parts of the state. In Henry county in southeastern Iowa, practically all of the young clover and alfalfa has been eaten down by Melanoplus femur-rubrum. In Tama county much damage has been done both to field and garden crops by Melanoplus bivittatus. I wish to report excellent success with the poison bran mash made according to the recent formula used by the Bureau.

R. L. Webster,
August 23,1917.

LOUISIANA.

The reports in the July and August numbers of the Circular of an outbreak of the fall webworm (Hyphantria cunea or textor) for both spotted and immaculate forms of the moth were observed in New Orleans during the heavy visitation of the second half of July - have been supplemented by frequent press dispatches from various sections of the state, showing that the outbreak is of much greater extent than was at first supposed. The principal trees in New Orleans attacked by the caterpillars were, mulberry, pecan, persimmon, sycamore,willow and sweet gums. In addition, the writer has seen eggplants, vegetable pears and "yard-long" beans almost completely defoliated within a few hours. In the latter case the caterpillars failed to web, the whole of the leaf being eaten; with sycamore, the leaves were skeletonized. Pecans, especially the younger trees, have suffered severely in St. Tammany parish, and from Tangiphao parish the caterpillars are reported to have attacked cotton, potatoes and general truck. Spraying with arsenate of lead was found efficacious in New Orleans in the case of ornamental trees, such spraying being carried to contiguous plants and shrubs not yet attacked. In isolated cases the trees were torched.

The long early summer drought, followed by intermittent rains and at times heavy downpours, has been followed in this immediate section by a rather marked increase in insect pests in general. This has had the effect of somewhat disheartening the householder who had planted a "war garden". Okra, tomatoes and eggplants, and in a less degree, early potatoes, have been subject to the attack of at least two species of thrips, the result

being in many cases absolute abortion of the blooms. In regard to okra perhaps some of the failures may be laid to the door of excessive watering of the plants rather than the work of insects. Early beets failed to "bulb", in most instances due to the work of flea beetles (Epitrix spp.). Damage to early corn through the corn ear worm (Heliothis obsoleta) has been rather spotted than showing any general damage. Peas and beans have suffered greatly from attacks of the pea aphis (Microsiphum pisi)and the cabbage aphis (Aphis brassicae), the principal culprit being the former. There have been a few outbreaks of Murgantia histrionica on cabbages and the Colorado potato beetle (Leptinotarsa 10-lineata) has done some damage to tomatoes and potatoes. The "orange dog" (Papilio chresphontes) has been very abundant this summer, but no special damage other than to roses has been noticeable.

At least two species of lace bugs (Corythuca spp.) are doing conspicuous damage to Chrysanthemums. The culture of this plant is an extensive and intensive one with New Orleans florists, the plants being set out in open houses which are either glazed or covered with cheese cloth for finishing. Rust (Puccinia sp.) and leaf spot and leaf blight have also shown marked increase of late under the heavy humidity conditions ruling generally. In regard to the Coccidae, outside of the cottony cushion scale, perhaps the most destructive this year has been Pseudococcus citri. A good part of the fig crop was destroyed. In connection with this and other "mealy bugs" and scale insects, the Argentine ant (Iridomyrmex humilis) is known to play a large part in the dissemination of the pests. In St. Bernard, the writer is informed that a community effort is being made towards reducing the number of ants. Some complaint has been received from rose growers of work by a species of nematode worm (Heterodera sp.). The same species seems to attack the roots of young fig trees. Other insects this season which have done damage to the roses have been a species of Euphoria, the Twelve spotted Diabrotica and the red spider (Tetranychus bimaculatus), the latter mainly in the early part of the summer. Thrips have done a great deal of damage, at least two species being implicated. Outdoor palms, bays, and other ornamental shrubs have been hurt materially by attacks of the scale Chrysomphalus ficus. This scale is decidedly on the increase.

In regard to stored product insects, the writer has heard little complaint this year of damage by the rice weevil (Calandra oryza). The partial immunity may be ascribed to the fact that stocks were practically cleaned up, while better storage methods here have helped to reduce damage. The confused flour beetle (Tribolium confusum) seems to be increasing in this seation, attacking stored rice, cowpeas, beans etc. This insect should be watched even closer than the rice weevil. The writer has seen recently lima beans offered for seed which were heavily infested with Bruchus sp. Red varieties of beans, on the other hand, showed only minor infestation. If he be permitted to offer a suggestion, seeing that New Orleans will be called on to store heavily for army purposes, that a note of warning be given the authorities in charge.

Ed. Foster,
August 25, 1917.

MAINE.

The following insects have been notably abundant in Maine during the first half of August:

Estigmene acraea, Diacrisia virginica, Mamestra picta, Papaipema nitela, Chelymorpha argus, Lygus pratensis.

Since August 15, the following have predominated: Estigmene acraea, Diacrisia virginica, Halisidota caryae, Datana ministra and Schizura concima.

Edith M. Patch,
August 23,1917.

MASSACHUSETTS.

A few reports of injury by the stalk borer, as well as some specimens of the caterpillars themselves, are still coming in. Some of the specimens which we are attempting to rear have already entered the pupal state, while most of the other caterpillars appear to be about ready to do so. Two reports were received indicating rather extensive injury to beans by what appeared to be cutworms. Two reports of injury by the squash-vine borer have been received. One report was received from the eastern part of the state stating that practically the entire raspberry crop belonging to that particular individual had been destroyed by the larvae of the American raspberry beetle Byturus unicolor. Mr.Jenks, agricultural advisor for Hampden county, sent in specimens which proved to be the Fulgorid, Ormenis septentrionalis, stating that these insects were"becoming serious in several of our back yards". Four reports have been received from Worthington, Chester, Hinsdale and Heath respectively, indicating extensive injury to shade and forest trees, particularly maple and beech, by the caterpillars of the Ceratocampid moth, Anisota rubicunda, and the Noctuid Moth, Heterocampa bilineata. This infestation seems to be within a restricted section in the northwestern part of the state. In every case these two species seem to be associated with the injury. The caterpillars appear to be practically two-thirds grown.

W.S.Regan,
Report of August 11.

Reports of insect injury to crops have fallen off to quite an extent during the past week. There have been a few reports of slight injury to the tops of potato plants by the tarnished plant bug. One report together with specimens, was received showing considerable injury to the roots of pansies by millepedes. The red-humped apple tree caterpillar, Datanas, the fall web worm and various other species of caterpillars are quite numerous upon fruit and other trees. I have personally noticed considerable injury to various fruit and ornamental trees by red spiders. In my report for last week I referred to injury to forest and shade trees in the Berkshires by the caterpillars of the two-lined prominent moth, and the green-striped maple worm, the caterpillar of the rosy Dryocampa moth. On Tuesday I took occasion to go over the infested region and found that these caterpillars are more or less prevalent through the counties of Berkshire, Hampshire and Franklin.

W.S.Regan,
Report of August 18.

MINNESOTA.

The cabbage maggot (Ponti rapae), which is rather late this season in Minnesota, is now appearing in fairly large numbers. As a matter of fact all Lepidoptera are behind in their appearance this season. The same is true of grasshoppers, which are quite abundant. The season is so far advanced, however, and the crops have made such good growth, that they will do but very little injury. It is not surprising that any insects on potatoes under present conditions cause alarm, and we have received several complaints from different localities reporting the occurrence of lice in large numbers on the still green vines. We have also had some complaint of white grubs, Lachnosterna species, working on the roots of strawberries.

F.L.Washburn,
August 24, 1917.

MISSISSIPPI.

During the month of August 1917 there have been fewer boll weevils in Mississippi than during any August for a number of years. In all parts of the state cotton fields can be seen that are covered with bloesoms. In the southern half of the state this is especially the case. Thr greatest boll weevil damage this year will be in the northern counties. During the past week the writer visited a number of cotton fields in south Mississippi in which no sign of boll weevil damage could be found.

Many complaints have been received from Jackson, Pike, Amite, Wilkinson, Lincoln, and other southern counties in regard to the smaller corn stalk borer (Elasmopalpus lignosellus Zell.). This species has apparently done more damage this year than any other insect to the corn crop. In some sections the damage has been extensive. Whole fields have been ruined, especially of late planted corn.

The fall web worm (Hyphantria cunea) was very abundant in this state during 1915-1916. Again this year it is causing considerable trouble especially in the southern half of the state. It is one of the worst pecan pests.

Several species of blister beetles belonging to the genus Epicauta, have been received from correspondents who reported them as injuring cotton, tomatoes, and beans.

Laphygma frugiperda has been reported as doing serious damage in the vicinity of Hattiesburg, and has been found several other places during the past month.

Diaphania nitidalis Cramer, and D. hyalinita Linn. are seriously damaging the various cucurbit crops in all sections of the state. This is generally a serious pest in this state. Reports are still coming in of damage to sweet potatoes by several species of tortoise beetles, especially Cassida bivittata.

The present prospects are that Mississippi will break all previous records for crop production this year. In 90 per cent of the state the corn crop exceeds anything ever before known and all other crops are in fine condition,

R.W.Harned, August 25.

MISSOURI.

Aphididae have caused serious injury to crops in several places throughout this state. Most damage has been done to cucurbits by the common melon or cucumber louse, Aphis gossypii, although the cabbage aphis, (A. brassicae) must be charged with its share of injury to cabbage and other cruciferous crops.

The cucumber beetles (Diabrotica vittata Fab., and D. 12-punctata Oliv.) have inflicted heavyblosses to melon growers in certain sections.

Potato growers have complainted of at least four injurious insects; the potato stalk borer (Trichobaris trinotata Say), the Colorado potato beetle (Leptinotarsa 10-lineata Say), various blister beetles mostly of the genus Epicauta, and the common stalk borer (Papaipema nitela Guen.)

The two common cabbage worms (Pontia rapae Sch., and Ceuthorhynchus rapae Gyll.) have been common in gardens.

Grasshoppers have taken some toll locally in several sections of Missouri, but of the bran mash or the Criddle mixture have proven successful against them.

Although the chinch bug has occurred in injurious numbers in several places, there is no general outbreak of them in this state. They seem to confine their injury to low-lying farms along the Mississippi and the Missouri Rivers.

Through excellent cooperation in some of the wheat growing sections of this state, the farmers therein were not damagingly affected by the Hessian fly. Plans for almost state-wide cooperation this fall indicate a bumper crop for next season and freedom from fly attack.

The joint worm (Isosoma spp.) is quite important in one or two sections of this state, but it is still superceded in importance by the Hessian fly.

Some complaints have been received about injury by weevils to sacked flour and stored grain, and fumigation has been resorted to with success.

Of orchard insects, this department has received complaints against the peach tree borer (Sanninoidea exitiosa Say), the shot-hole borer (Xyleborus dispar Fab.), the bag-worm (Thyridiopteryx ephemeraeformis), the San Jose scale, (Aspidiotus perniciosus Comst.) and others, one of which, Aspidiotus townsendi Okll. is reported injurious to the fruit and foliage of plum.

A.H.Hollinger, Asst.Ent.
August 25,1917.

NEBRASKA.

The outbreak of grasshoppers in western Nebraska, which began in July, has continued and developed during August. It has become especially severe in the irrigated district of the North Platte Valley in Scotts Bluff and western Morrill counties. As usual, the two-striped, differential and red-legged grasshoppers are the species mostly concerned, although Melanoplus affinis is very abundant in the alfalfa fields of that region. These insects are also proving unusually numerous and locally destructive in northeastern Nebraska, north of the 42nd parallel. If favorable conditions occur during the coming winter and spring, it is highly probable that more injury by grasshoppers will occur in northern and

western Nebraska next year, and efforts are being directed toward the prevention and elimination of as much of this as possible.

In the past two weeks we have received numerous reports indicating an unusual abundance of the corn leaf apnis in many corn fields of south central Nebraska. The tassels and axils are often completely covered with these lice, and some farmers declare that their fields are being seriously injured by them. Some trouble was experienced with armyworms innwestern Sarpy county early in the month. Injuries by the striped blister beetle to alfalfa and sugar beets in south central Nebraska continued during early August. On the beets they were successfully killed by spraying with Paris green at the rate of one pound to fifty gallons of water.

The white-marked tussock moth continues to be conspicuous on the shade trees of the cities of eastern Nebraska. The most important vegetable pests of the month have been the cabbage worms, which are making a heavy attack on the late cabbage all over the state, and the melon aphis which is destroying patches of cucumbers and melons. Occasional reports of injuryeto field beans and tomatoes by red spiders are also being received.

Myron H. Swenk,
August 24,1917.

NEVADA.

So far as conditions in the state are known to us, there has been a most unusual lack of injury due to insect pests of any description. Plant lice of all kinds have been present only in greatly reduced numbers, and we have received practically no complaints of insect injuries to alfalfa or wheat.

S? B.Doten,
August 17, 1917.

NEW JERSEY.

The insect of especial interest just now is the Japanese Saarabeid (Popilia japonica). It made its appearance last season in Burlington county, New Jersey, and this season seems to be spreading. It is known to infest scatteringly an area half a mile square. It is an insect rather similar to the rose chafer in life history and habits. It was probably imported in soil about the roots of Iris and forms a further argument against the admission of nursery stock from foreign countries, the roots of which are surrounded and covered with soil. It is a general feeder, devoting its attention primarily to weeds. It seems to be especially fond of smartweed and virginia creeper. It does, however, attack cherry, grape and roses. According to literature the beetles are out from June to September in Japan. We have found them in July and August in New Jersey. Attempts to poison the adults with arsenate of lead under field conditions have apparently resulted in failure, the insects migrating from the treated plants to untreated ones. In this respect it also agrees with the rose bug.

Thomas J.Headlee,
August 25, 1917.

NEW YORK.

The light crop of apples in western New York has served to emphasize codling moth work and as a consequence there is an unusually high percentage of "side injury", and recent reports indicate that a great number of caterpillars are either continuing into the fruit from the shallow entrances or entering for a second time at such places so that many apples will be marked by large worm holes on the side.

The late leaf-feeders, especially the red-humped apple tree caterpillar, the yellow-necked apple tree caterpillar, the fall webworm, the hickory tussock moth caterpillar and the black walnut caterpillar have all been unusually abundant and injurious. This is particularly true of the hickory tussock moth caterpillar and to a less extent of the fall webworm.

Pear psylla appears to have been fairly well controlled in most commercial orchards, especially where there was a thorough application of the delayed dormant spraying. There has been some breeding in unsprayed orchards and apparently more injury than usual in the southern Hudson Valley.

A leaf roller and skeletonizer appeared upon apple trees in Rockland and Westchester counties partly skeletonizing and lightly webbing some 50 to 75 per cent of the leaves and producing a condition which suggested at a little distance singeing by fire.

Wheat midge was reported early in the month as having destroyed one fourth of the normal wheat yield in Niagara county. The insect has been generally present in Genesee, Orleans, and Ontario counties, though in much less numbers. It appears to be very difficult to get accurate estimates as to the amount of damage caused.

Potato aphis has appeared in most of the northern counties of the state, being abundant and injurious in a few fields, though in some cases the damage is rated as comparatively small.

The black flea beetle has continued its work causing considerable damage in a number of counties, especially Dutchess and Orange.

An infestation of the European earwig was reported from East Aurora.

E.P. Felt,
August 24,1917.

NORTH CAROLINA.

During the month under review the insects reported have been of unusually large variety, - chief among which have been cabbage worms and cotton red spider, especially the latter which, favored by a dry spring, has become epidemic notwithstanding that June and part of July had more rain than usual.

As there is no easy, simple remedy for cotton red spider no public campaign has been made against it, but all complainants are sent our bulletin on cotton insects in which it is discussed and are referred to the United States Department of Agriculture Farmers' Bulletin on the subject.

We are inaugurating a publicity campaign on the use of poisons against cabbage worm. County agents in sixteen counties where it is now an issue have been informed and requested to give it publicity. A mailing list of commercial cabbage growers in these and other counties is being

made up to be circularized.

Among the other pests reported are: cotton leaf-louse, weevils of grain and peas, blister beetles, ants, aphids, tomato fruitworm, San Jose scale, fruit bark beetle, and many others of less importance.

F. Sherman,
August 20,1917.

OHIO.

Since reporting to you July 27, the scourge of potato or tomato aphis Macrosiphum solanifolii has largely abated. We have received twnetyone reports relating to aphids, most of them relating to this species, and all but one located in the northern part of Ohio. Some of the worst infested districts were investigated by members of our staff, and the damage was found to be considerable, but nowhere did it compare with that previously inflicted in the south western counties. At the time of my last report, natural enemies of the aphids had gained great headway in the southwestern and central districts, and have since spread over the state cleaning up the scourge fairly well. Two or three reports referred to the corn leaf aphis (A. Maidis). Six correspondents have sought advice regarding control of the grain weevil. Five wanted to know how to control the bean weevil. By means of press bulletins and notices in our Monthly Bulletin we have given instructions how to prepare bins for the reception of the new crop, and how to control the various forms of weevil in case they develop in the bins. Cabbage worms have been of about their usual abundance so far as we have been able to collect data. The onion thrips has been the subject of inquiry from Beach City and McGuffey, the latter being in one of the great onion districts of the state. Considerable damage by thrips is noted among onions about wooster. The yellow-necked caterpillar of the apple, Datana ministra has been very abundant locally, and was received from Cambridge, Ohio. The fall web worm has also been abundant locally and has probably done rather widespread damage. It was reported from Paulding, Ohio. We still continue to receive specimens of the tussock moth, indicating that it was numerous over a large part of the state. The clover seed Chalcid (Brucophagus funebris) was received from Marysville, Ohio, where it was reported to be attacking Alfalfa seed. The hickory bark beetle (Scolytus quadrispinosus) was received from Cuyahoga Falls where it was destroying hickory trees. The shot-hole borer was received from Madison and from Springfield. The grape vine saw fly (Erythraspides pygmea)was received from Akron, Ohio. It has been received from several other points this season, indicating that it is much more abundant this year than usual. The lappet moth (Toype velleda)attacking apple was received from Paulding, and also from Ashtabula, Ohio. Jiggers were reported troublesome at Hamilton and McConnelsville. The squash vine borer was received from Mount Vernon. An unidentified species of spring-tail was found injuring ginseng, Lewisville, Ohio.

We have opened our campaign for extensive wheat seeding and rather early sowing. This has been done by means of press notices and an article for the Ohio Farmer; also by an article for the Monthly Bulletin of the Station to be published in early September, and by means of exhibits at the State and County Fairs. We have made up three sets of exhibits for county fairs, each exhibit consisting of a map showing the routes

of field explorations followed by our surveyors and also indicating by shaded areas the counties having more than 3 per cent of wheat joint worm. A poster suitably framed and hinged to the map gives instructions as to dates of seeding, preparation of seed bed, fertilization and other means of minimizing joint worm damage. We have three sets of county exhibits which cover more than half the counties of the state each fall. We have also prepared for the state fair a special exhibit of the work and biology of the potato aphid.

H. A. Gossard,
August 22, 1917.

PENNSYLVANIA.

The bag worm (Thyridopteryx ephemeraeformis) is quite prevalent in the southern counties, attacking especially cedar, arbor vitae, various shade and fruit trees. Shrubs have also suffered in some instances, and in one case which the writer observed, garden vegetables, corn, lima beans, lettuce, and similar crops, were almost completely stripped of their leaves. The bagworms had stripped the foliage from cedar trees standing along the edge of the garden, and then descended to the garden plants.

The fall webworm (Hyphantria cunea) is now becoming noticeable especially along roadsides; shade trees, especially maples and walnuts, are often badly beaten. In many orchards, this insect has been reported in undue abundance, and is causing considerable alarm.

The potato flea beetle (Epitrix cucumeris) has been very abundant this season and many potato patches are completely ruined by its work. With this species, the potato louse (probably Macrosiphum solanifolii) has undoubtedly noticeably reduced the yield of potatoes in this state. "War gardens" have suffered especially.

The work of the curculio (Conotrachelus nenuphar) is beginning to show up on apples, especially the late feeding cavities of the adults.

C.H.Hadley, Jr.,
August 27,1917.

TEXAS.

Answering yours about pests up to date for the past month will say that the great heat and drought has given us a surprise attack of red spider on the crop of Tepary beans. I have one demonstrator who has in prospect the loss of ten to fifteen acres from this pest. The plants are literally covered and the spiders are spreading. If the heat and drought both keep up this will be a serious matter with other bean crops of this variety.

The second surprise is an attack of an alfalfa crop by the alfalfa army worm. The first brood to show in any numbers is now about half grown. I am having this meadow mowed closely and raked off while green and then irrigated very heavily, holding the water on the land for a time. This alfalfa is also being over run by the same red spider from an adjoining field of Tepary beans which is badly infested with that pest.

Some time ago I found what I take to be a new species of the web worm, or rather a species of Crambus working near the surface of the ground at the stems of the Tepary beans. It follows on into the ground by the side of the bean stalk or right at the surface with its web funnel.

F. W. Mally,
August 24, 1917.

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F. W. Mally,

VIRGINIA.

There have been numerous complaints about the corn ear worm, the insect being reported as injurious to tomatoes as well as to field corn.

Following a campaign of several months to improve beekeeping in this state a number of persons interested in the production of honey, met at Blacksburg during the meeting of the State Farmers' Institute, and organized the Virginia State Beekeepers' Association. The beekeepers assembled appeared to be very enthusiastic and the prospects for the improvement of the industry are bright.

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